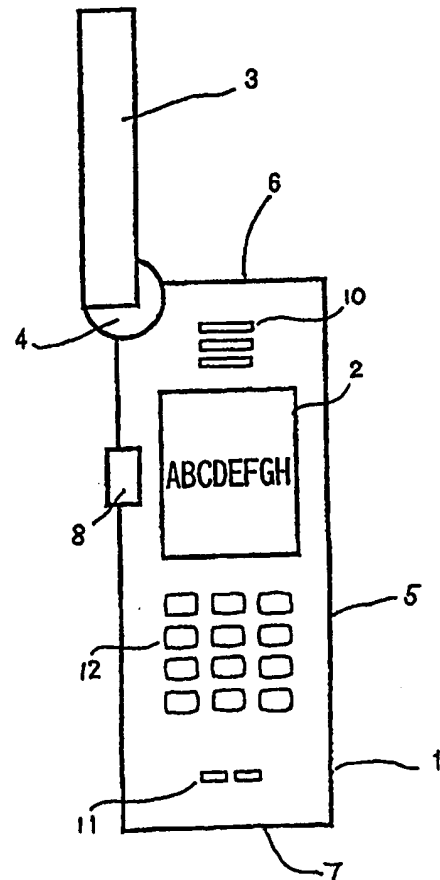


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04M 1/00	A2	(11) International Publication Number: WO 00/03528 (43) International Publication Date: 20 January 2000 (20.01.00)
(21) International Application Number: PCT/JP99/03683 (22) International Filing Date: 8 July 1999 (08.07.99) (30) Priority Data: 9815003.0 11 July 1998 (11.07.98) GB (71) Applicant (for all designated States except US): NEC CORPORATION [JP/JP]; 7-1, Shiba 5-chome, Minato-ku, Tokyo 108-8001 (JP). (72) Inventor; and (75) Inventor/Applicant (for US only): HENNELLY, Martin, James [GB/GB]; NEC Technologies (UK) Ltd., The Imperium, Level 3, Imperial Way, Reading, Berkshire RG2 0TD (GB). (74) Agents: WAKABAYASHI, Tadashi et al.; 8th Floor, 16th Kowa Building, 9-20, Akasaka 1-chome, Minato-ku, Tokyo 107-0052 (JP).		(81) Designated States: AU, CA, JP, KR, NO, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i>

(54) Title: MOBILE TELEPHONE**(57) Abstract**

A mobile telephone with a display unit on which the orientation of displayed text, numerals or devices is switched automatically when different configurations of the telephone are selected. The orientation of the displayed text, numerals or devices encourages the user to direct the telephone to the position of optimum performance for the selected configuration. Changes of configuration by the deployment or the stowage of a satellite antenna causes inversion of displayed text.



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DESCRIPTION

MOBILE TELEPHONE

TECHNICAL FIELD

5 This invention relates to mobile telephones, and more particularly to the performance of mobile telephones in differing configurations.

BACKGROUND ART

 A mobile telephone includes its display unit and the
10 change of orientation of the display unit itself is well known in the prior art. Such changes of orientation are usually in response to a user's choice or to accommodate different types of data appearing on the display unit.

 The prior art does not teach, however, the use of
15 the orientation of the data appearing on a display unit for enhancement of the performance of a mobile telephone.

DISCLOSURE OF INVENTION

 It is an object of the present invention to provide a mobile telephone which can change the orientation of
20 text, numerals, data or devices in a display unit to an orientation promoting and supporting a preferred direction of operation for the mobile telephone.

 According to the invention there is provided a mobile telephone operating under the control of a control means
25 and including a display unit, the orientation of text,

numerals or devices displayed on the display unit being changed automatically to correspond with an orientation preferential for operating performance of the mobile telephone following a change of configuration of the
5 mobile telephone.

When a letter or numeral is displayed to the user, the user may be expected to hold the mobile telephone in a manner that allows the letter or numeral to be presented in its normal direction. There will then be a
10 correspondence between the display and the preferential orientation of the mobile telephone in the selected configuration.

The above and other objects, features, and advantages of the present invention will become apparent
15 from the following description when taken in conjunction with the accompanying drawings which illustrate a preferred embodiment of the present invention by way of example.

20 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of a mobile telephone set according to the present invention;

Fig. 2a is a front view of the mobile telephone set shown in Fig. 1 with a deployed antenna; and

25 Fig. 2b is a front view of the mobile telephone set

shown in Fig. 1 with the antenna in a stowed position.

BEST MODE FOR CARRYING OUT THE INVENTION

As shown in Fig.1, a mobile telephone set according to the present invention comprises an antenna 3 for transmitting and receiving radio waves, a display unit 2 as display means for displaying information, a speaker 10 for outputting information as voice sound, a microphone 11 for receiving information as voice sound, a button 12 for receiving information, CPU 9 as control means for processing the information received via the button 12 and the microphone 11, outputting the processed information to the antenna 3, processing the information received via the antenna 3, outputting the processed information to the speaker 10, and controlling the content of the display and the direction of the display at the display unit 2, and a microswitch 8 as a switching means for generating an interrupt signal to control the direction of the display at the display unit 2 to CPU 9 by its ON- and OFF- states.

A method of controlling the direction of the display at the display unit 2 of the mobile telephone set of the above structure will be described below.

As shown in Fig. 2a and Fig. 2b, a mobile telephone set has a display unit 2, a microswitch 8, CPU 9, a speaker 10, a microphone 11 and a button 12 in the housing 5. And

the antenna 3 is supported by a rotational joint 4 with the housing 5 so that the antenna 3 can rotate. When the antenna 3 rotates and is in a stowed position, the antenna 3 contacts the microswitch 8.

5 For satellite communication telephone handsets, an effective way of mounting the antenna is by a rotational joint on the top of the communications handset. To achieve sufficient signal strength in the communications channel and to allow communications to proceed, the antenna must
10 be deployed. Deployment of the antenna is effected usually from a stowed position by rotating the antenna about the rotational joint toward the line of sight to the satellite.

Antenna 3 is shown in Fig.2a in the deployed position, extending from rotational joint 4 with the
15 distal end of the antenna pointing skyward. In this deployed position the gain of antenna 3 is maximum in the general direction of the top of the mobile telephone, along the line of the physical communication channel.

In the stowed position the antenna 3 as shown in
20 Fig.2b depends from rotational joint 4 and lies alongside the casing 5 of mobile telephone 1. The maximum gain of the antenna in the stowed position is toward the bottom of the mobile telephone i.e. away from the direction of the physical communication channel. With the antenna in
25 the stowed position, however, it is required that the

mobile telephone should still be able to receive paging and other control channels.

In order to support and to promote use of the mobile telephone in the preferred orientation for both deployed
5 and stowed positions the text displayed on display unit 2 is changed to correspond with the preferred orientation. Therefore with the antenna 3 in the deployed position and the preferred orientation of the mobile telephone as shown in Fig.2a with top 6 pointing generally towards the sky
10 (skyward) and bottom 7 pointing generally towards the earth (earthward) the text in display unit 2 will be displayed for the user to read normally i.e. as shown by "ABCDEFGH" in Fig.2a.

When the antenna 3 is in the stowed position, however
15 inversion of the mobile telephone such that bottom 7 points skyward and top 6 points earthward will provide better reception for paging and control signals. This inverted position is therefore the preferred direction for the performance of the mobile telephone when the antenna 3
20 is in the stowed position.

A two position switch, microswitch 8 is switched when the antenna 3 is moved to the stowed position by the action of the antenna 3 being pushed into place. CPU 9 controlling the operation of the mobile telephone detects
25 the change in state of the microswitch 8, by an interrupt

from the microswitch 8 and inverts the text on the display unit 2. The text orientation on the display for the antenna stowed position will then be inverted as shown in Fig.2b.

In this example it is not necessary to switch the
5 functions of the speaker and earpiece microphones because visual data only is received in either one of the configurations. On receipt of the interrupt from the microswitch 8, however, CPU 9 can also switch the functions of speaker and earpiece microphones or many other
10 functions as required for an arrangement other than described herein.

The invention may also be applied to telephones with touch sensitive screens or speech recognition functions and the number of orientations available for
15 the display need not be restricted to two. A tilt switch may be employed instead of microswitch 8, for example, to indicate various orientations of the telephone housing.

Although a certain preferred embodiment of the
20 present invention has been shown and described in detail, it should be understood that various changes and modifications may be made therein without departing from the scope of the claims.

CLAIMS

1. A mobile telephone comprising:
an antenna for transmitting and receiving radio waves;
display means for displaying information; and
5 control means for changing the direction of said information displayed on said display means based on the orientation of the mobile telephone.
2. A mobile telephone according to claim 1, wherein the direction of said antenna is variable.
3. A mobile telephone according to claim 2, wherein said control means change the direction of said information displayed on said display means based on the direction of said antenna.
4. A mobile telephone according to claim 1, further comprising:
switching means for detecting the orientation of the mobile telephone;
5 said control means changes the direction of said information displayed on said display means based on the results of detection said switching means.

5. A mobile telephone according to claim 2,
further comprising:

switching means for detecting the direction of said
antenna;

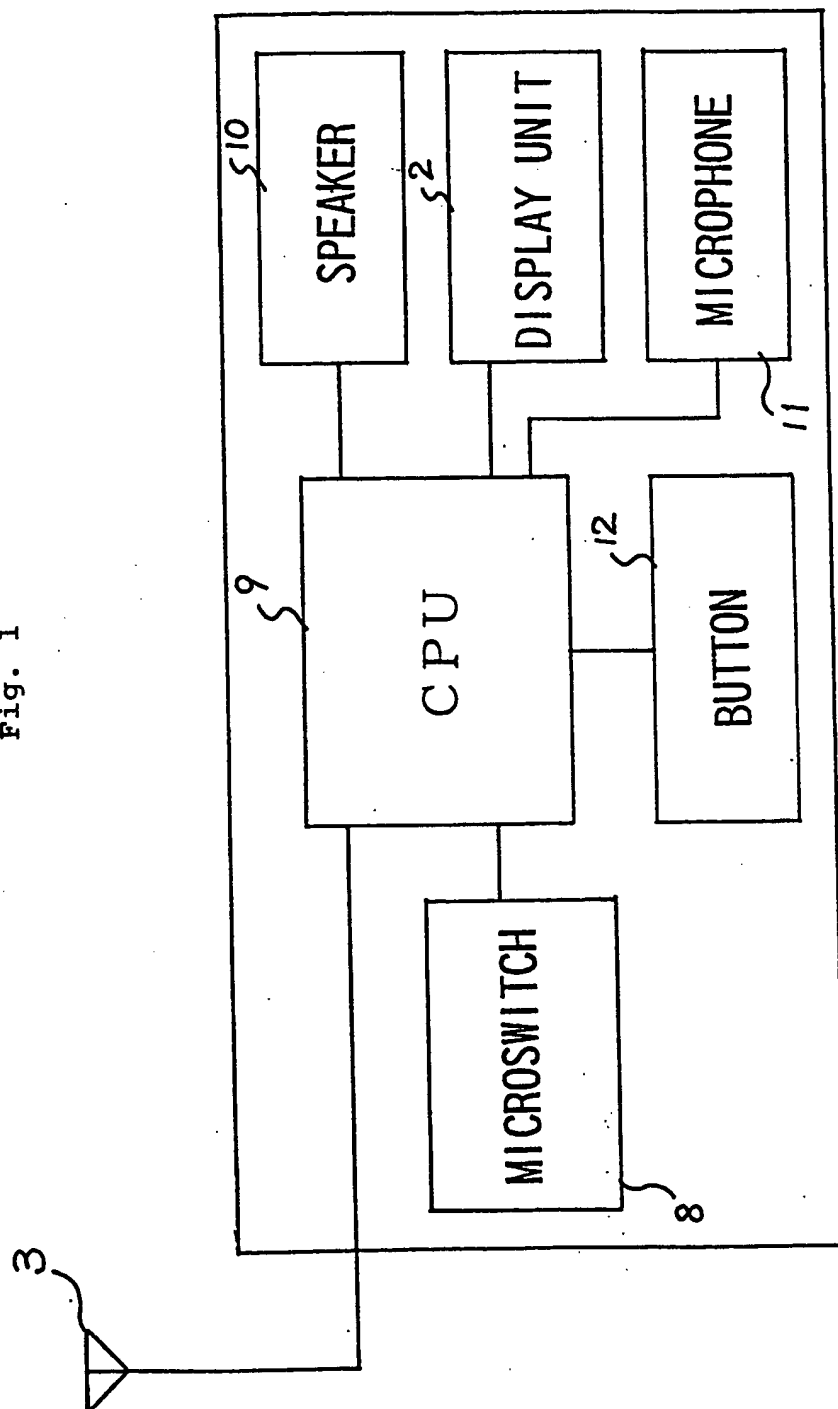
5 said control means change the direction of said
information displayed on said display means based on the
results of detection on said switching means.

6. A mobile telephone according to claim 3,
further comprising:

switching means for detecting the direction of said
antenna;

5 said control means change the direction of said
information displayed on said display means based on the
results of detection on said switching means.

Fig. 1



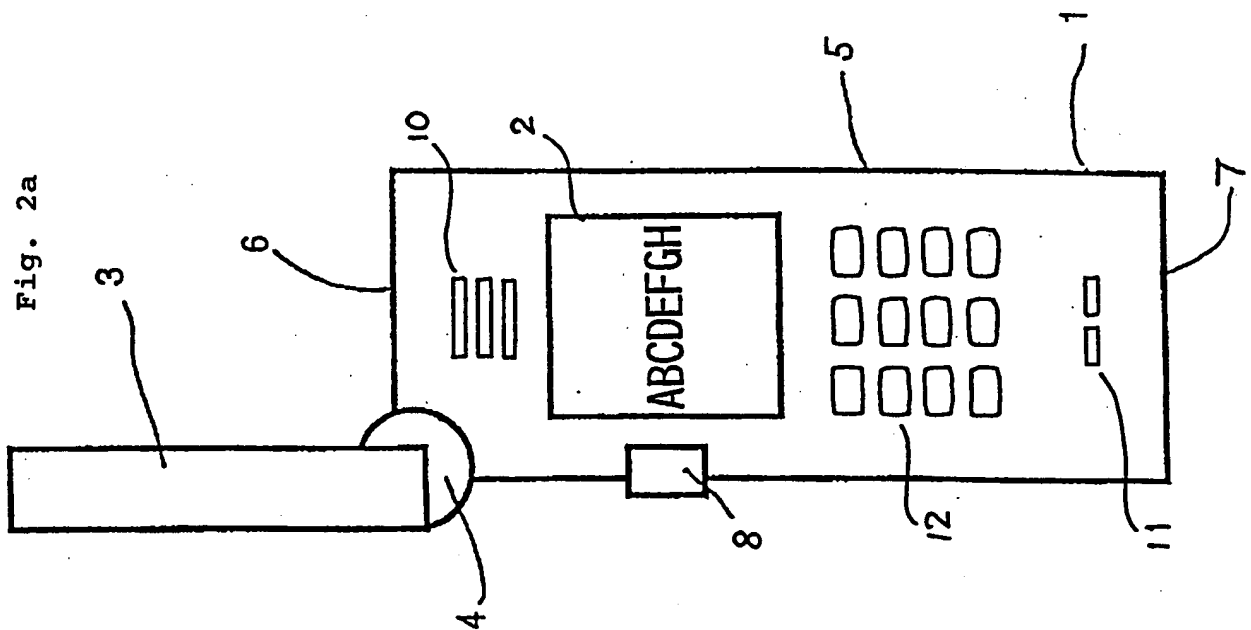


Fig. 2b

